Training, Other Qualifications, and Advancement
Employers generally hire high school graduates who meet their requirements for keyboarding speed. Increasingly, employers also expect applicants to have word processing or data entry training or experience. Spelling, punctuation, and grammar skills are important, as is familiarity with standard office equipment and procedures.

Students acquire skills in keyboarding and in the use of word processing, spreadsheet, and database management computer software packages through high schools, community colleges, business schools, temporary help agencies, or self-teaching aids such as books, tapes, or Internet tutorials applications.

For many people, a job as a data entry and information processing worker is their first job after graduating from high school or after a period of full-time family responsibilities. This work frequently serves as a steppingstone to higher paying jobs with increased responsibilities. Large companies and government agencies usually have training programs to help administrative employees upgrade their skills and advance to other positions. It is common for data entry and information processing workers to transfer to other administrative jobs, such as secretary, administrative assistant, statistical clerk, or to be promoted to a supervisory job in a word processing or data entry center.

Job Outlook
Overall employment of data entry and information processing workers is projected to decline through 2010. Nevertheless, the need to replace those who transfer to other occupations or leave this large occupation for other reasons will produce numerous job openings each year. Job prospects will be most favorable for those with the best technical skills—in particular, expertise in appropriate computer software applications. Data entry and information processing workers must be willing to continuously upgrade their skills to remain marketable.

Although data entry and information processing workers are all affected by productivity gains stemming from organizational restructuring and the implementation of new technologies, projected growth differs among these workers. Employment of word processors and typists is expected to decline due to the proliferation of personal computers which allows other workers to perform duties formerly assigned to word processors and typists. Most professionals and managers, for example, now use desktop personal computers to do their own word processing. Because technologies affecting data entry keyers tend to be costlier to implement, however, these workers will be less affected by technology and should experience slower than average growth.

Employment growth of data entry keyers will still be dampened by productivity gains, as various data capturing technologies, such as bar code scanners, voice recognition technologies, and sophisticated character recognition readers, become more prevalent. These technologies can be applied to a variety of business transactions, such as inventory tracking, invoicing, and order placement. Moreover, as telecommunications technology improves, many organizations will increasingly take advantage of computer networks that allow data to be transmitted electronically, thereby avoiding the reentry of data. These technologies will allow more data to be entered automatically into computers, reducing the demand for data entry keyers.

In addition to technology, employment of data entry and information processing workers will be adversely affected as businesses increasingly contract out their work. Many organizations have reduced or even eliminated permanent in-house staff, for example, in favor of temporary-help and staffing services firms. Some large data entry and information processing firms increasingly employ workers in nations with low wages to enter data. As international trade barriers continue to fall and telecommunications technology improves, this transfer will mean reduced demand for data entry keyers in the United States.

Earnings
Median annual earnings of word processors and typists in 2000 were $24,710. The middle 50 percent earned between $20,070 and $29,500. The lowest 10 percent earned less than $16,410, while the highest 10 percent earned more than $35,410. The salaries of these workers vary by industry and by region. In 2000, median annual earnings in the industries employing the largest numbers of word processors and typists were:

Local government	$25,710
State government	24,850
Federal Government	23,890
Elementary and secondary schools	23,300
Personnel supply services	22,720

Median annual earnings of data entry keyers in 2000 were $21,300. The middle 50 percent earned between $17,850 and $25,820. The lowest 10 percent earned less than $15,140, and the highest 10 percent earned more than $30,910. In 2000, median annual earnings in the industries employing the largest numbers of data entry keyers were:

Federal Government	$27,260
Accounting, auditing, and bookkeeping	22,310
Computer and data processing services	20,480
Commercial banks	20,410
Personnel supply services	20,070

In the Federal Government, clerk-typists and data entry keyers without work experience started at $16,015 a year in 2001. Beginning salaries were slightly higher in selected areas where the prevailing local pay level was higher. The average annual salary for all clerk-typists in the Federal Government was 24,934 in 2001.

Related Occupations
Data entry and information processing workers must transcribe information quickly. Other workers who deliver information in a timely manner are dispatchers and communications equipment operators. Data entry and information processing workers also must be comfortable working with office automation, and in this regard they are similar to court reporters, medical records and health information technicians, secretaries and administrative assistants, and computer operators.

Sources of Additional Information
For information about job opportunities for data entry and information processing workers, contact the nearest office of the State employment service.

Desktop Publishers

(O*NET 43-9031.00)

Significant Points

- Desktop publishers rank among the 10 fastest growing occupations.
- Most jobs are in firms that handle commercial or business printing, and in newspaper plants.
- Although formal training is not always required, those with certification or degrees will have the best job opportunities.

Nature of the Work

Using computer software, desktop publishers format and combine text, numerical data, photographs, charts, and other visual graphic elements to produce publication-ready material. Depending on the nature of a particular project, desktop publishers may write and edit text, create graphics to accompany text, convert photographs and drawings into digital images and then manipulate those images, design page layouts, create proposals, develop presentations and advertising campaigns, typeset and do color separation, and translate electronic information onto film or other traditional forms. Materials produced by desktop publishers include books, business cards, calendars, magazines, newsletters and newspapers, packaging, slides, and tickets. As companies have brought the production of marketing, promotional, and other kinds of materials in-house, they increasingly have employed people who can produce such materials.

Desktop publishers use a keyboard to enter and select formatting specifics such as size and style of type, column width, and spacing, and store them in the computer. The computer then displays and arranges columns of type on a video display terminal or computer monitor. An entire newspaper, catalog, or book page, complete with artwork and graphics, can be created on the screen exactly as it will appear in print. Operators transmit the pages for production either into film and then into printing plates, or directly into plates.

Desktop publishing is a rapidly changing field that encompasses a number of different kinds of jobs. Personal computers enable desktop publishers to perform publishing tasks that would otherwise require complicated equipment and human effort. Advances in computer software and printing technology continue to change and enhance desktop publishing work. Instead of receiving simple typed text from customers, desktop publishers get the material on a computer disk. Other innovations in desktop publishing work include digital color page makeup systems, electronic page layout systems, and off-press color proofing systems. And because most materials today often are published on the Internet, desktop publishers may need to know electronic publishing technologies, such as Hypertext Markup Language (HTML), and may be responsible for converting text and graphics to an Internet-ready format.

Typesetting and page layout have been affected by the technological changes shaping desktop publishing. Increasingly, desktop publishers use computers to do much of the typesetting and page layout work formerly done by prepress workers, posing new challenges for the printing industry. The old "hot type" method of text composition—which used molten lead to create individual letters, paragraphs, and full pages of text—is nearly extinct. Today, composition work is primarily done with computers. Improvements in desktop publishing software also allow customers to do much more of their own typesetting.

Desktop publishers use scanners to capture photographs, images or art as digital data that can be incorporated directly into electronic page layouts or further manipulated using computer software. The desktop publisher then can correct for mistakes or compensate for deficiencies in the original color print or transparency. Digital files are used to produce printing plates. Like photographers and multimedia artists and animators, desktop publishers also can create special effects or other visual images using film, video, computers, or other electronic media. (Separate statements on photographers and artists and related workers appear elsewhere in the *Handbook*.)

Depending on the establishment employing these workers, desktop publishers also may be referred to as publications specialists, electronic publishers, DTP operators, desktop publishing editors, electronic prepress technicians, electronic publishing specialists, image designers, typographers, compositors, layout artists, and web publications designers.

Desktop publishers use computer software to prepare material for publication.

Working Conditions

Desktop publishers usually work in clean, air-conditioned office areas with little noise. Desktop publishers usually work an 8-hour day, 5 days a week. Some workers—particularly those self-employed—work night shifts, weekends, and holidays.

Desktop publishers often are subject to stress and the pressures of short deadlines and tight work schedules. Like other workers who spend long hours working in front of a computer monitor, they may be susceptible to eyestrain, back discomfort, and hand and wrist problems.

Employment

Desktop publishers held about 38,000 jobs in 2000. Nearly all worked in the printing and publishing industries. About 1,000 desktop publishers were self-employed.

Most desktop publishing jobs were found in firms that handle commercial or corporate printing, and in newspaper plants. Commercial printing firms print a wide range of products—newspaper inserts, catalogs, pamphlets, and advertisements—while business form establishments print material such as sales receipts. A large number of desktop publishers also were found in printing trade services firms. Establishments in printing trade services typically perform custom compositing, platemaking, and related prepress services. Others work printing or publishing materials "in-house" or "in-plant" for business services firms, government agencies, hospitals, or universities, typically in a reproduction or publications department that operates within the organization.

The printing and publishing industry is one of the most geographically dispersed in the United States, and desktop publishing jobs are found throughout the country. However, job prospects may be best in large metropolitan cities.

Training, Other Qualifications, and Advancement

Most workers qualify for jobs as desktop publishers by taking classes or completing certificate programs at vocational schools, universities and colleges, or via the Internet. Programs range in length, but the average nondegree certification training program takes approximately 1 year. However, some desktop publishers train on the job to develop the necessary skills. The length of training on the job varies by company. An internship or part-time desktop publishing assignment is another way to gain experience as a desktop publisher.

Students interested in pursuing a career in desktop publishing also may obtain an associate degree in applied science or a bachelor's

degree in graphic arts, graphic communications or graphic design. Graphic arts programs are a good way to learn about desktop publishing software used to format pages, assign type characteristics, and import text and graphics into electronic page layouts to produce printed materials such as advertisements, brochures, newsletters, and forms. Applying this knowledge of graphic arts techniques and computerized typesetting usually are intended for students who may eventually move into management positions, while 2-year associate degree programs are designed to train skilled workers. Students also develop finely tuned skills in typography, print mediums, packaging, branding and identity, Web design and motion graphics. These programs teach print and graphic design fundamentals and provide an extensive background in imaging, prepress, print reproduction, and emerging media. Courses in other aspects of printing also are available at vocational-technical institutes, industry-sponsored update and retraining programs, and private trade and technical schools.

Although formal training is not always required, those with certification or degrees will have the best job opportunities. Most employers prefer to hire people who have at least a high school diploma, possess good communication skills, basic computer skills, and a strong work ethic. Desktop publishers should be able to deal courteously with people because in small shops they may have to take customer orders. They also may add, subtract, multiply, divide, and compute ratios to estimate job costs. Persons interested in working for firms using advanced printing technology need to know the basics of electronics and computers.

Desktop publishers need good manual dexterity, and they must be able to pay attention to detail and work independently. Good eyesight, including visual acuity, depth perception, field of view, color vision, and the ability to focus quickly, also are assets. Artistic ability often is a plus. Employers also seek persons who are even-tempered and adaptable—important qualities for workers who often must meet deadlines and learn how to operate new equipment.

Workers with limited training and experience may start as helpers. They begin with instruction from an experienced desktop publisher and advance based on their demonstrated mastery of skills at each level. All workers should expect to be retrained from time to time to handle new, improved software and equipment. As workers gain experience, they advance to positions with greater responsibility. Some move into supervisory or management positions. Other desktop publishers may start their own company or work as an independent consultant, while those with more artistic talent and further education may find opportunities in graphic design or commercial art.

Job Outlook

Employment of desktop publishers is expected to grow much faster than the average for all occupations through 2010, as more page layout and design work is performed in-house using computers and sophisticated publishing software. Desktop publishing is replacing much of the prepress work done by compositors and typesetters, enabling organizations to reduce costs while increasing production speeds. Many new jobs for desktop publishers are expected to emerge in commercial printing and publishing establishments. However, more companies also are turning to in-house desktop publishers, as computers with elaborate text and graphics capabilities have become common, and desktop publishing software has become cheaper and easier to use. In addition to employment growth, many job openings for desktop publishers also will result from the need to replace workers who move into managerial positions, transfer to other occupations, or who leave the labor force.

Printing and publishing costs represent a significant portion of a corporation's expenses, no matter the industry, and corporations are finding it more profitable to print their own newsletters and other reports than to send them out to trade shops. Desktop publishing reduces the time needed to complete a printing job, and allows commercial printers to make inroads into new markets that require fast turnaround.

Most employers prefer to hire experienced desktop publishers. As more people gain desktop publishing experience, however, competition for jobs may increase. Among persons without experience, opportunities should be best for those with computer backgrounds who are certified or who have completed postsecondary programs in desktop publishing or graphic design. Many employers prefer graduates of these programs because the comprehensive training they receive helps them learn the page layout process and adapt more rapidly to new software and techniques.

Earnings

Earnings for desktop publishers vary according to level of experience, training, location, and size of firm. Median annual earnings of desktop publishers were $30,600 in 2000. The middle 50 percent earned between $22,890 and $40,210. The lowest 10 percent earned less than $17,800, and the highest 10 percent earned more than $50,920 a year. Median annual earnings in the industries employing the largest numbers of these workers in 2000 are shown below:

Commercial printing	$30,940
Newspapers	24,520

Related Occupations

Desktop publishers use artistic and editorial skills in their work. These skills also are essential for artists and related workers; designers; news analysts, reporters, and correspondents; public relations specialists; writers and editors; and prepress technicians and workers.

Sources of Additional Information

Details about apprenticeship and other training programs may be obtained from local employers such as newspapers and printing shops, or from local offices of the State employment service.

For information on careers and training in printing, desktop publishing, and graphic arts, write to:

➤ Graphic Communications Council, 1899 Preston White Dr., Reston, VA 20191. Internet: **http://www.npes.org**

➤ Graphic Arts Technical Foundation, 200 Deer Run Rd., Sewickley, PA 15143. Internet: **http://www.gatf.org**

For information on benefits and compensation in desktop publishing, write to:

➤ Printing Industries of America, Inc., 100 Daingerfield Rd., Alexandria, VA 22314. Internet: **http://www.gain.org**

Financial Clerks

(O*NET 43-3011.00, 43-3021.01, 43-3021.02, 43-3021.03, 43-3031.00, 43-3041.00, 43-3051.00, 43-3061.00, 43-3071.00)

Significant Points

- Most jobs require only a high school diploma.
- Numerous job opportunities should arise due to high turnover.
- Slower than average growth is expected in overall employment, reflecting the spread of computers and other office automation as well as organizational restructuring.